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OF THE

TORREY BOTANICAL CLUB

JUNE, 1903

Botanical Explorations in Georgia during the Summer of 1901.—II. Noteworthy Species

BY ROLAND M. HARPER

Unless otherwise noted, the plants mentioned below were collected on my expedition of 1901, the itinerary of which was described in the last number of the BULLETIN.

ADIANTUM CAPILLUS-VENERIS L.

Although this interesting fern has not yet been reported from Georgia by any other botanist, it is quite widely distributed in the lime-sink region. Last summer * I found it quite adundant in Dooly County (no. 1064) not far from where I first discovered it several years ago, also in the central part of Lee County (no. 1161), and in all the lime-sinks visited in Decatur County, especially at Forest Falls (no. 1193). The illustration of this waterfall in the geological bulletin already mentioned led me to suspect very strongly the occurrence of the *Adiantum* there, and evidence in support of this suspicion accumulated as I drew near the place. In Camilla I was told that "a maidenhair fern, different from the one in the mountains," grew at Forest Falls, and in Thomasville the next day I saw specimens of it in cultivation which were said to have been obtained there. On the inaccessible perpendicular side of the sink, within reach of the spray of the waterfall, it grows most luxuriantly.

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* As this paper was mostly prepared in the spring of 1902, such phrases as this of course refer to 1901.

[The preceding number of the BULLETIN, Vol. 30, No. 5, for May, 1903 (30: 271–318, *pl. 13, 14*), was issued 16 My 1903.]

ADIANTUM HISPIDULUM Sw. Syn. Fil. 124. 1806

Collected in an apparently unused well in the outskirts of Thomasville, where it was accompanied by *Woodwardia areolata*, on the morning of August 9 (no. 1171). As far as I know, this Old World species has never been reported as growing spontaneously in the United States. It was fairly abundant and fruiting copiously, and seemed as much at home as the *Woodwardia*, which is a common inhabitant of wells in South Georgia.*

ISOETES FLACCIDA Shuttl.

This species (or some forms of it) is represented in my 1901 collection by five numbers, all from the coastal plain, though no species of *Isoetes* had previously been reported from the coastal plain of the southeastern United States outside of Florida.

Numbers 843 and 951, partly emersed, were collected in June in a sluggish pine-barren stream in Bulloch County, and no. 1112 was found in a similar situation in Sumter County, July 24. It is not absolutely certain that these three numbers represent the typical *I. flaccida*, which grows in "lakes and clear streams, middle and west Florida," and is said † to mature in April and May and disappear in June.

Number 1010 is a plant of rather different habit and habitat. It was found in wet pine-barrens around a mayhaw (*Crataegus aestivalis*) pond in Sumter County, and was a smaller and stiffer plant than the others. It grows in the greatest abundance, but so concealed by the tall grass that one might walk over it day after day without suspecting its presence. I only discovered it accidentally by pulling up a specimen with another plant, but on getting down on my knees I found it in apparently inexhaustible quantities. At that time, July 5, there was more water in these pine-barrens than I ever saw before or after, and yet none of the *Isoetes* was completely submersed, so it is almost a strictly terrestrial plant. The principal species accompanying it were *Sagittaria* sp., *Eleocharis tricostata, Rhynchospora Tracyi, Rhexia aristosa, Sabbatia campanulata, Breweria aquatica, Gerardia linifolia,*

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*On a subsequent visit (Sept. 18, 1902) the *Adiantum* was found to be still flourishing.

† Engelm. Trans. Acad. Sci. St. Louis, 4: 386. 1882.

Helenium sp., and *Rudbeckia Mohrii.* I did not revisit the locality until August 22, at which time the *Isoetes* seemed to have completely disappeared, but a careful search revealed its dead and withered leaves lying flat on the moist ground, and the ripe sporangia buried just below the surface.

Number 1046, collected on July 11 around a cypress (*Taxodium imbricarium*) pond near Cobb in the same county, had much the same appearance, though differing slightly in habitat. These two numbers last mentioned are referred by Mr. A. A. Eaton, who has examined some of my specimens, to *I. flaccida rigida* Engelm. (Trans. Acad. Sci. St. Louis, **4**: 386. 1882), which he considers merely a later emersed state of *I. flaccida.* There are some discrepancies between my specimens and the original description of this variety, as regards season and habitat, but these may perhaps be due only to the difference in latitude, the original specimens having come from south Florida.

The above observations on *Isoetes* are mentioned chiefly to show the great necessity for further field work on the southern species, and to indicate that the genus may be found much more abundant in the Southern States than at present supposed.

SAGITTARIA ISOETIFORMIS J. G. Smith, Rep. Mo. Bot. Gard. **6**: 115. *pl. 53.* 1895

This interesting little plant was collected on the muddy margin of a small pine-barren pond in Decatur County, between Forest Falls and Bainbridge, August 12 (no. 1198), where it was accompanied by *Eleocharis tricostata*, and it was seen a few hours later in and around Open Pond, in the same county. It seems to have been known hitherto only from peninsular Florida.

The specific name is a most appropriate one, doubtless more so than its author realized. The submersed sterile form grows in great abundance in the shallow clear water of Open Pond near the shore, just as *S. graminea* does in New England, and it is here impossible to distinguish it from *Isoetes* without close examination.

CYPERUS RETROFRACTUS (L.) Torr.

While walking along the summit of the Pine Mountain range in Meriwether County, on the 29th of August, I noticed for the first time that this species has an adaptation for dissemination by animal agencies. After passing through a patch of it I found many of the spikelets adhering to my clothes by their sharp points. I do not know whether any other species of the genus behaves in the same way, but not many of them have the reflexed spikelets which are an essential feature of this mode of dissemination.

CYPERUS IRIA L.

This introduced species was found rather common in cultivated fields in the Chattahoochee River bottoms in Early County, August 14 (no. 1224). Not previously reported from Georgia, Florida or Alabama, though there can be little doubt that it grows also on the other side of the river in the other two states.

Scirpus fontinalis sp. nov.

Culms tufted, 12–18 dm. long, triangular at least below, the summits very slender and nodding. Basal leaves few, 3–4 dm. long by 3–5 mm. wide; stem-leaves few or several, ascending or almost appressed, slender and acute: umbels compound, unequal-rayed, axillary and terminal, the 1–4 lateral ones on slender flattened drooping peduncles 1–3 dm. long: spikelets (often partly transformed into tufts of leaves) all on slender pedicels, 2–3 mm. thick, oblong when young, their axes elongating as the lower scales drop off and becoming finally about 1 cm. long: scales oblong, acute, concave, 1.5 mm. long, with scarious whitish margins and green keels: bristles 6, smooth, tortuous, about as long as the achene: achene light brown, oblong, triquetrous, 1 mm. long, acute at both ends, covered with minute depressed conical papillae, and tipped with the short slender base of the style.

This species is somewhat intermediate between *S. divaricatus* Ell. and *S. lineatus* Michx., but is abundantly distinct from either. It resembles the latter (which has not yet been reported from Georgia) in having axillary umbels, but differs in most of its essential characters, such as its smaller spikelets and pointless green scales, and others more difficult to describe. From *S. divaricatus* it is readily distinguished by its slender nodding culms, ascending leaves, long internodes and long-peduncled axillary umbels, as well as by its thicker spikelets and papillose mucronate achenes, and by its habitat. *S. divaricatus* is a stouter usually erect plant, with numerous widely spreading or deflexed leaves and a single diffuse terminal umbel, generally inhabiting muddy swamps of creeks and rivers. It too is often proliferous late in the season, but the tufts of leaves spring from the nodes oftener than from the inflorescence. (This character is well shown in my no. 1142, collected in the swamp of Muckalee Creek above Americus, July 30.) In all the specimens of *S. divaricatus* examined I have observed no deviation from a strictly terminal umbel, while in the species under consideration every specimen I saw had at least one lateral one.

The specimens of *Scirpus fontinalis* were collected in the shallow margin of a shaded pool of clear cool water issuing from a spring within the corporate limits of Leslie, Sumter County, on the afternoon of July 6 (no. 1012). It was accompanied by *Cyperus strigosus*, *Scirpus Eriophorum*, *Rhynchospora miliacea*, *Juncus setaceus*, *Polygonum setaceum*, *Samolus floribundus*, and other semi-aquatic plants. The temperature of the water was taken the same afternoon and the next morning, in different parts of the pool and at various depths, and was found to be in every case 68° Fahrenheit. It probably does not vary much from this point throughout the year. A fragment of fossiliferous rock from the hillside just above the spring was sent to the U. S. Geological Survey and identified as being probably of the Zeuglodon horizon (uppermost Eocene). The chemical composition of this rock has not been determined, but the water issuing from it is reputed to be limestone water.

ELEOCHARIS ROBBINSII Oakes

On July 13 I found in the northern part of Lee County a pine-barren pond perhaps ten acres in extent and two feet deep in the middle, almost filled with this species (no. 1068), growing so luxuriantly as to conceal the water. This seems to be the only station reported for it between Delaware and Florida. The only other plants seen in the deeper parts of the pond were *Homalocenchrus hexandrus* and a few small *Cephalanthus* bushes. Around the margins of the pond were observed among other things *Sporobolus compressus*, *Rhynchospora fusca*, *R. Tracyi*, *Scleria gracilis*, *Polygala ramosa*, *Stillingia aquatica*, *Rhexia aristosa* and *Boltonia diffusa*, some of which have an equally remarkable distribution.

RHYNCHOSPORA FUSCA (L.) Ait. f.

Collected on the sandy margin of a pine-barren pond in the northern part of Lee County (as just mentioned) July 13 (no. 1067). This species has apparently been reported but once before from the Southern States. Mr. M. L. Fernald * mentions its having been collected by A. H. Curtiss, at Milton, Santa Rosa County, Florida (no. 5929, July 8, 1897). The specimen under this number in the U. S. National Herbarium looks very much like mine, but the one at the New York Botanical Garden has a somewhat different appearance and may not represent the same species. I have more recently discovered that Mr. Nash's no. 1321, from the sandy shore of Lake Juana, Lake Co., Florida, July, 1894, distributed as *R. gracilenta*, is also *R. fusca*, at least the representation of it in the U. S. National and Columbia University herbaria; and Mr. Fernald informs me that the material in the Gray Herbarium is the same. These southern specimens differ from northern and European ones in being a little more slender, but otherwise seem to be identical.

RHYNCHOSPORA DODECANDRA Baldw.

Collected on the rosemary sand-hills of Emanuel County, where it is one of the most characteristic species, June 28 (no. 977); also in very dry white sand about two miles from Open Pond, Decatur County, August 13 (no. 1216), where it was associated with *Paronychia riparia*, *Dicerandra linearifolia*, *Serenoa* and *Stipulicida*. It does not seem to have been reported from Georgia before, or so far inland, these two stations being about sixty miles from the coast.

MAYACA FLUVIATILIS Aubl.

Mr. Fernald has recently reported † the collection of this South American species by Mr. Curtiss last year in Florida. It is represented in my 1901 collection by no. 1179, from a cypress pond in Thomas County, August 9. There are some differences between this species and *M. Aubleti* which Mr. Fernald failed to mention. The leaves of *M. fluviatilis* are much longer and more acute, exceeding the peduncles, and the capsule is oblong instead of globose. My specimens were completely submersed, while *M. Aubleti* usually grows in sandy bogs rather than in ponds. I have not been able to detect any essential difference in the finely sculptured seeds, however.

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* Bot. Gaz. **24**: 433. D 1897

† Bot. Gaz. **33**: 154. 21 F 1902.

On August 12 I saw what was probably the same plant in Decatur County, but did not collect it. There are quite a number of specimens referable to this species in the U. S. National Herbarium and that of Columbia University, mostly from Florida.

XYRIS SMALLIANA Nash, Bull. Torrey Club, **22**: 159. 1895

Collected on the morning of July 19 (no. 1096) in a shallow pond in the woods south of Omaha, Stewart County, where it was abundant, and accompanied by *Panicum digitarioides*, *Scirpus cylindricus* (no. 1095), *Pontederia cordata*, *Castalia odorata* (no. 1097), *Brasenia purpurea*, *Limnanthemum aquaticum*, *Monniera Caroliniana*, *Utricularia purpurea* and other interesting plants. Previously reported only from the type-locality in Florida.

Xyris scabrifolia sp. nov.

Plants solitary, grayish green. Roots fibrous: stem with a slightly bulbous base 6–8 mm. in diameter, enveloped in the pale striate membranous sheaths of the leaves: leaves 1–3, usually 2, erect, acute, slightly twisted, 3–4 dm. long, about 3 mm. wide at the middle, tapering below (about 1.5 mm. wide just above the sheath), the whole surface of the blade minutely transversely rugose; uppermost sheath 12–15 cm. long, very obliquely truncate, acute: scape 5–7 dm. tall, 1–2 mm. in diameter, terete except for a minute longitudinal ridge on one side, pale and rugose like the leaves: head oblong, about 12 mm. long and 8 mm. thick at maturity: scales oblong, entire, the largest 7–8 mm. long: lateral sepals lanceolate, about 3 mm. long, the narrow wing of the keel lacerate above the middle: corolla yellow.

This species seems nearest to *X. Caroliniana* Walt., but differs from that and all other species known to me in the rugose, almost scabrous, surface of its leaves and scapes. This peculiar rugosity makes it as rough to the touch as some species of *Equisetum*, such as *E. laevigatum*. It differs further from *X. Caroliniana* in its terete scape and pale sheaths. It is a very slender plant, resembling in this respect *X. flexuosa* Muhl. (especially southern specimens of that species).

My specimens were collected on August 28 in an open bog near Woodbury, Meriwether County, at about 775 feet altitude (no. 1254). They were accompanied by an interesting association of plants, most of them coastal plain types, such as *Lycopodium pinnatum* (no. 1255), *Eleocharis tuberculosa*, *Rhynchospora axillaris*, *Juncus trigonocarpus* (no. 1253), *Polygala cruciata* (no. 1257), *Eryngium virgatum* (no. 1252) and *Gratiola pilosa*. This locality is about 25 miles from the nearest part of the coastal plain.

Before this time apparently only two or three of our North American species of *Xyris*, namely, *X. flexuosa*, *X. montana* and perhaps *X. Caroliniana*, had been known outside of the Atlantic coastal plain, and it is noteworthy that in these three species *X. scabrifolia* finds its nearest relatives.

Dr. Engelmann, in Plantae Lindheimerianae,* described a variety *scabra* of *X. Caroliniana*, but his plant is now treated as identical with *X. flexuosa*, and his description shows that it is quite different from my plant.

In Dr. Mohr's herbarium (now deposited in the U. S. National Museum) there is a specimen which is doubtless my *X. scabrifolia*, mounted on the same sheet with two specimens of *X. flexuosa* collected near Mobile, July 14, 1883.

JUNCUS MEGACEPHALUS M. A. Curtis

Collected in low grounds just back of the sand-dunes on Tybee Island, June 21 (no. 925), where it was accompanied by *J. aristulatus* (no. 926) and several other plants mostly maritime; also in a moist shaded sandy place among the lime-sinks east of Muckalee Creek in Lee County, August 2 (no. 1159), with *Cyperus cylindrostachys*, *Dichromena colorata* (no. 1157) and one or two other species which I had previously seen only along the coast.

The differences between this long-neglected species and its relatives were well pointed out by Mr. Coville † several years ago, and my specimens agree perfectly with his description; they have also been examined by him and compared with authentic specimens. I do not find that this species has been reported from

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* Boston Jour. Nat. Hist. 5: 235. 1845.

† Bull. Torrey Club, 22: 302–305. 1895.

Georgia before. It seems always to indicate the absence of the Lafayette formation.

JUNCUS DIFFUSISSIMUS Buckley

On July 3 I found a most luxuriant growth of this species (no. 995), in a marshy place near Stillmore, Emanuel County, thus extending its known range about 150 miles farther eastward than the station reported by me * last year. Associated with it were *Panicum scabriusculum*, *Sagittaria Mohrii* (no. 994), *Eleocharis tuberculosa*, *Juncus Elliottii*, *J. polycephalus*, *J. trigonocarpus*, *Sarracenia rubra*, *Rhus Vernix* and other species of more or less interest, the *Sagittaria* being also considerably farther east than it had been reported before.

IRIS VERNA L.

This species, usually in the southeastern states an inhabitant of dry pine-barrens, was collected on August 29 on the northern slopes of the Pine Mountains in Meriwether County, at about 800 feet altitude (no. 1266), and seen five days later and 200 feet higher in dry woods in Campbell County, but without traces of flower or fruit at either locality.

As noted by Dr. Small † a few years ago, the leaves of this species become considerably elongated in summer, but he failed to mention the interesting fact that although equitant, they are decidedly dorsiventral, being bright green on one side and glaucous on the other. They spread out like a fan and bend away from the rootstock (which is perpendicular to the plane of the leaves), in this way bringing the green side uppermost.

GYMNADENIOPSIS NIVEA (Nutt.) Rydb.

Habenaria nivea (Nutt.) Spreng.

Collected in the pine-barrens of Bulloch County, June 15 and 26 (nos. 892, 954). One of the specimens of the latter number was the largest I ever saw, being nearly 6 dm. tall, with about sixty flowers in the spike. The object of mentioning this species here, however, is to note that the flowers are plainly 5-ranked in the spike, as may be readily ascertained by looking at a living plant endwise. I have never seen this character mentioned before, and do not know how many species share it, but it is certainly not the case with all orchids, or even with all spicate ones, as for instance in *Gyrostachys*, different species of which have the flowers in one, three or four ranks.

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* Bull. Torrey Club, 28 : 469. 1901.

† Bull. Torrey Club, 24 : 175. 1897.

PARONYCHIA HERNIARIOIDES (Michx.) Nutt; Spreng. Syst. **1**: 822. 1825*

Collected on the ordinary sand-hills along Big Lott's Creek in Bulloch County, June 17 (no. 912), and on the rosemary sand-hills of Emanuel County, June 28 (no. 978); also seen on July 3 in similar situations in Tattnall and Montgomery Counties, especially along the left bank of the Little Ocmulgee River at the western border of the latter.

This species has usually been described as prostrate, but incorrectly. Young specimens, like no. 912, have much the habit of *Anychia dichotoma*, while fully developed specimens, such as no. 978, have the numerous branches very widely speading, making the plant considerably broader than high, but they seem to be strictly self-supporting, and never show the slightest indication of being prostrate. Such a specimen when pressed has very much the appearance of *Euphorbia cordifolia* Ell., a strictly prostrate plant, and this is doubtless the cause of the error.

Cabomba Caroliniana pulcherrima var. nov.

Stem a meter or more in length, reddish-purple. Submersed leaves similar to those of *C. Caroliniana*, but dark-colored and with narrower segments. Peduncles tortuous. Petals bright purple. Floating leaves, calyx and fruit nearly as in the species.

Although further study may show this to be a distinct species, the differences at present known seem only to entitle it to varietal rank. The purple stem and petals are the most striking features. The latter are of exactly the same color as the corolla of *Utricularia purpurea*, for which species our plant might easily be mistaken a short distance away. I find no mention of a purple-flowered *Cabomba* in botanical literature.

Collected in three or four feet of water in Cane Water Pond,

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*The place of publication of *Paronychia herniarioides* is usually given as Nuttall's Genera, but in that work only the name appears, without synonymy or description.

Decatur County, on the morning of August 13 (no. 1209). The plant was pretty well distributed over the pond, though not in great abundance. The specimens which resemble mine most closely, of all the herbarium material I have examined, were collected by Rugel in 1843 in Lake Jamony (Iamonia) and near Tallahassee, Florida, but their age makes it impossible to tell what the color of their petals might have been. More recent specimens, collected near Tallahassee by N. K. Berg, and preserved in the herbarium of the New York Botanical Garden, show the purple petals quite distinctly, besides resembling mine in general appearance as much as do those of Rugel. Both of these localities are within forty miles of mine.

Castalia odorata latifolia var. nov.

Leaves floating in deep water, orbicular with narrow sinus and acute lobes, 4–6 dm. broad, the veins thick and prominent beneath and copiously anatomosing near the slightly upturned margins; flowers large, the longest petals about 1 dm. long. Otherwise very similar to *C. odorata.* (*Castalia reniformis* Nash: not *Nymphaea reniformis* Walt.)

The identity of Walter's *Nymphaea reniformis* * has long been a puzzle. His description, "foliis reniformibus, corollis polypetalis, loculis monospermis," does not fit any known plant, and Mr. E. G. Baker, of the British Museum, has informed me that there is no specimen of it in Walter's herbarium. Willdenow, Pursh and Elliott took up the species on Walter's authority, apparently without being themselves acquainted with it, Willdenow placing it in *Nelumbium*, probably on account of the phrase "loculis monospermis," which may have been an error. Delessert's figure, probably the only one which pretends to represent the species, shows a flower much like that of *Castalia odorata*, and a leaf with the basal lobes rounded as in *Nymphaea* (*Nuphar*), but with the venation of *Castalia.* If this figure is trustworthy (and it has the appearance of having been carefully drawn), it does not represent any species at present known, but it would be rash to deny that such a plant exists, until the Southern States have been better explored than they are at present. Delessert says of his plant "Crescit in Carolina (Fraser)," and it should be borne in mind that Fraser was acquainted with Walter, and is said to have attended to the publication of his "Flora Caroliniana" in London, so that he was in an excellent position to know Walter's species. DeCandolle says of *Nymphaea reniformis*, "(v. s.)," doubtless referring to one of Fraser's specimens, probably the same one from which Delessert's figure was drawn. So unless there is evidence to the contrary this figure must be accepted as representing Walter's *Nymphaea reniformis*, a species which should perhaps take rank with *Gordonia pubescens* and *Pyrola oxypetala* as being lost to science.

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* *Nymphaea reniformis* Walt. Fl. Car. 155. 1788; DC. Syst. 2: 55. 1821; Delessert, Ic. Select. 2: 3. *pl. 5.* 1823; DC. Prodr. 1: 115. 1824.

Nelumbium reniforme Willd. Sp. Pl. 2: 1260. 1799.

Cyamus reniformis Pursh, Fl. Am. Sept. 398. 1814; Ell. Bot. S. C. & Ga. 2: 68. 1821.

Nymphaea odorata β Torr. & Gray, Fl. N. Am. 1: 57. 1838.

N. odorata reniformis Lehm. Nymphaea, 13. 1853 (?)

In later years *N. reniformis* has been associated in synonymy with *N. tuberosa* Paine,* a northern species, but probably on insufficient grounds. About ten years ago Professors Trelease and Hitchcock independently transferred DeCandolle's *Nymphaea reniformis* to *Castalia*, apparently overlooking the fact that Walter was the author of the species. Professor Hitchcock's plant (from Iowa) is *C. tuberosa*, and the identity of that of Professor Trelease is immaterial, as he gave neither description nor synonymy. A few years later Mr. Nash † published the same combination, crediting the specific name correctly to Walter, but associating it with specimens collected by him in Lake Ella, Lake County, Florida, in 1894 (nos. 1153, 1180).

It is Mr. Nash's plant in which I am particularly interested, for I collected specimens which seem exactly to match his in Cane Water Pond, Decatur County, on the morning of August 13 last year (no. 1212). To avoid any possible confusion in the future,

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* *Nymphaea tuberosa* Paine, Cat. Pl. Oneida Co. N. Y. 132. 1865.

Castalia tuberosa Greene, Bull. Torrey Club, **15**: 84. 1888; Britton & Brown, Ill. Fl. **2**: 44. *f. 1532.* 1897.

Nymphaea reniformis "DC." A. Gray, Manual, ed. 6. 56. 1890; Syn. Fl. N. Am. **1**: 76. 1895.

Castalia reniformis "(DC.)" Trel.; Branner & Coville, Rep. Geol. Surv. Ark. 1888^4: 164. 1891 (name only); A. S. Hitchcock, Trans. Acad. Sci. St. Louis, **5**; 484. 1892.

† Bull. Torrey Club, **22**: 147. 1895.

I will designate my own specimens as the type of the foregoing description. Similar specimens are in the Columbia University Herbarium, collected in Louisiana by Dr. Hale, and in Thomas County, Georgia, by Dr. Small in 1895. But this southern plant seems to differ from *Castalia odorata* only in its larger size and more prominent veins on the lower surface of the leaves, and is probably entitled only to varietal rank at the most. It cannot be the *Nymphaea reniformis* of Walter,* so I have given it a new name as above.

The leaves of my specimens were fully as large as those described by Mr. Nash, and their edges were often slightly upturned, as also noted by him, allowing the wind to get under them and turn them partly over. This plant is very abundant in Cane Water Pond, and its leaves and flowers are the most conspicuous objects on the surface of the water there.

NYMPHAEA ORBICULATA Small, Bull. Torrey Club, **23**: 128. 1896

On August 9 I visited the type-locality of this species in Thomas County for the purpose of securing some authentic fresh specimens for Dr. Gerrit S. Miller, Jr., who is doing some work on the genus, and I had little difficulty in finding it (no. 1178). Four days later it was seen in Cane Water Pond, in the next county.

I can now correct an unfortunate error in the original description. Dr. Small says of the leaves, "the upper leaves rough with irregular papillae," but in reality the upper surface is perfectly smooth in life, but becomes rough in drying, as in some other species of the genus. Dr. Small calls the locality "a small lake," but it is nothing but a cypress pond, the level of which has been artificially raised a few feet for fishing purposes by a dam, and it could hardly be dignified by the name of lake.

SARRACENIA MINOR Walt.

S. lacunosa Bartr. Travels, 417. 1791.

S. variolaris Michx. Fl. Bor. Am. **1**: 310. 1803.

In a previous paper † I referred to the probable identity of

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* See in this connection Robinson, Syn. Fl. N. Am. **1**: 76. 1895.

† Bull. Torrey Club, **27**: 428. 1900.

Sarracenia minor Walt. with *Sarracenia variolaris* Michx. Walter's description, though of course very brief, is amply sufficient to distinguish this species from any other now known, but to settle the question finally I wrote in May, 1901, to Mr. E. G. Baker, of the British Museum, asking if the species was represented in Walter's herbarium, and if so what it was like. He very kindly complied with my request, and informed me that such a specimen existed, and that it was evidently the same as *S. variolaris* Michx., the only trouble being that it was not labeled *S. minor* but *S. lutea*, a name which was never published. But as the other species mentioned by Walter were also there, and correctly named, it was evident that the *S. lutea* of his herbarium must be the *S. minor* of his flora, the reason for the change of name probably being that there is another species with yellow flowers (*S. flava* L.), which is a much larger plant. *S. minor* and *S. variolaris* were rightly considered synonymous by Elliott and several other authors of that period, but for some reason their identity has been doubted by some later authors.

I have no additional notes on this species at the present writing, except that it seems to be the most widely distributed species of *Sarracenia* in the coastal plain of Georgia. It grows in company with *S. flava*, *S. rubra* and *S. psittacina*, as well as in many places where none of the other species are present. It is represented by my numbers 678, from Coffee County, September 21, 1900, and 854, from Bulloch County, June 10, 1901. I have also seen it in Chatham, Effingham, Emanuel, Tattnall, Sumter, Lee and Thomas Counties, always in moist pine-barrens. It is not known from Alabama, however, and I have not seen it within fifty miles of the Chattahoochee River in Georgia.

Sarracenia flava × minor

On June 10 I collected in moist pine-barrens in Bulloch County a single specimen of a curious plant which must be regarded as a hybrid between *Sarracenia flava* and *S. minor*. It consisted of a short horizontal rootstock, like that of most species of the genus, bearing a single erect leaf which seems in every way exactly intermediate between those of the two supposed parents. It was yellowish green, with the hood horizontal (ascending in *S. flava*, deflexed — though horizontal when pressed — in *S. minor*), pubescent and reticulated with reddish veins beneath. The dimensions of the pressed leaf are: length of tube, 34 cm.; diameter at throat, 5 cm.; length of hood, 6 cm.; wing, 5 mm. wide at the middle. This specimen (no. 855) is now in the U. S. National Herbarium.

Where I collected it both of the supposed parents (as well as *S. rubra*, which, however, could have had nothing to do with it) were growing in the immediate vicinity.

It is a curious fact that although there are numerous hybrid Sarracenias in cultivation,* with almost every possible combination of parentage, apparently none has yet been artificially produced between these two yellow-flowered species.

SARRACENIA CATESBAEI Ell. Bot. S. C. & Ga. **2**: 11. 1821

S. flava Catesbaei Mohr, Bull. Torrey Club, **24**: 23. 1897.

There seems to be considerable mystery still surrounding this plant, and the following notes may serve to throw some light on the subject. Elliott described the species from specimens collected by Dr. James Macbride in Chesterfield district (now county), in South Carolina (near the edge of the coastal plain), but states that these specimens are exactly similar to one of the figures on Plate 69 of the second volume of Catesby's "Natural History of Carolina." This, however, should perhaps not be taken too literally, for the figure referred to is a poor one and does not accurately represent any known species; but it most resembles the plant which is now usually accepted as *S. Catesbaei*. Croom, in his monograph of the genus,† states that he has seen Elliott's specimen and was unable to distinguish it from *S. flava*. Most subsequent authors seem to have accepted this view until Dr. Mohr revived *Catesbaei* as a variety in 1897, assigning the name to specimens collected on Lookout Mountain, in DeKalb County, Alabama. In his Plant Life of Alabama it is restored to specific rank. ‡

Last summer, on July 8, I collected in a boggy place southeast of Americus some specimens (no. 1021), which seem to represent this species, intimately associated with *S. rubra* and *S. Drummondii.* It was immediately recognized as a plant which I had seen six years previously in a similar locality about a mile away, where it was associated with the same two species. At that time (1895) the possibility of finding a species not in the standard text-books had never occurred to me, and I referred it to one of the other species. In thinking over the matter a few years later I came to the conclusion that it must be a hybrid between the two species associated with it, but last summer I was convinced that this could not be the case, as the resemblance of *S. Catesbaei* to *S. rubra* is rather remote, and it has some characters not possessed by either of the other two. Elliott says of *S. Catesbaei* that it can be connected with no other species than *S. flava;* but I have noticed a very close and probably hitherto unsuspected relationship between *S. Catesbaei* and *S. Drummondii.* The leaves of these two are of almost exactly the same size and shape, differing principally in coloring, and I fancied that I could almost detect an intergradation between them, for many of the leaves of *S. Catesbaei* had the upper parts of the leaves faintly white-spotted, like those of *S. Drummondii* but in lesser degree. The inner surface of the hood was also pubescent with stiff reflexed hairs, as in *S. Drummondii.* But all had the iridescent purple spot in the throat, a character which is shared only with *S. flava.* If my plant was a hybrid, *S. flava* could hardly be one of its parents, for that species is not known to occur within 27 miles of this place (and in all my travels in Georgia I have never yet seen it west of the Flint River, though it is abundant east of there).

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* See Nicholson, Dict. Gard., and Bailey, Cycl. Am. Hort.

† Ann. Lyc. N. Y. 4: 104. 1836.

‡ Contr. U. S. Nat. Herb. **6**: 531. 1901.

If the flowers of my plant could be obtained its affinities would be better known, but strangely enough, I have never been able to find the slightest traces of flower or fruit on it. The flowers of this species seem to be very rare. Catesby figures two flowers with yellow petals on the plate cited by Elliott, but these probably belong with the other leaf figured on the same plate, which is a leaf of *S. minor.* Elliott says the flowers of *S. Catesbaei* are unknown to him. In the herbarium of Columbia University there are several very doubtful specimens labeled *S. Catesbaei,* but these are either without flowers or the flowers are detached and may not have been collected with the leaves, and besides they are so old that their color is lost.

Dr. Mohr says of *S. Catesbaei*: "Flowers yellow," but the specimens in his herbarium have no flowers. One of them is like mine, except for being smaller (as might be expected from the elevation at which it grew, 2,000 feet), but the other one so labeled looks more like *S. flava*, and it is possible that both species occur together on Lookout Mountain. The only flowering specimen of *S. Catesbaei* I have seen was collected at the same place by Professor A. Ruth in July, 1898 (no. 253).

But even without flowers *S. Catesbaei* seems to be sufficiently distinct from the other six species (all of which I have often seen in the field), which are often found sterile also (especially the two large ones, *S. flava* and *S. Drummondii*), whether on account of immaturity or unfavorable conditions I do not know.

Further observations of this species in the field, especially in the vicinity of Elliott's type-locality, are much to be desired.

CRATAEGUS CONTRITA Beadle, Biltmore Bot. Stud. **1** : 61. 1902

Collected in the dry deciduous woods about half a mile north of Whigham, on the Lafayette clay at 275 feet altitude, August 10 (no. 1184). The underlying formation here is the Chattahoochee (Upper Oligocene), the same as at the type-locality of this species, which happens to be also the type-locality of the formation.

CRATAEGUS INSIDIOSA Beadle, Biltmore Bot. Stud. **1** : 94. 1902

Collected in dry red clay soil among the hills a few miles northwest of Americus, July 30 (no. 1143). This species and the preceding have been identified for me by Mr. Beadle.

PRUNUS CUTHBERTII Small, Bull. Torrey Club, **28** : 290. 1901

Collected on the steep rocky slopes of the Pine Mountains, at 800 feet altitude, in Upson and Meriwether Counties, August 28 and 29 (nos. 1261 and 1267). Recently reported from Warm Springs in the latter county by Mr. C. L. Boynton.* This species is very different in aspect from some of its relatives, and in winter would hardly be taken for a *Prunus* at all. It is a small straggling tree with short crooked branches and rough bark not unlike that of a *Diospyros*. It seems to be closely related to *P. Alabamensis* Mohr.

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* Biltmore Bot. Stud. **1** : 145. 1902.

This is probably the same species found by Dr. Mohr on the mountains of Clay and Talladega Counties, Alabama, and referred by him to *P. serotina neomontana* Sudw., for his description * (written of course before *P. Cuthbertii* was published) exactly fits my specimens from the corresponding portion of Georgia.

KRAMERIA SECUNDIFLORA DC. (*K. lanceolata* Torr.)

Collected on the sand-hills of Big Lott's Creek, Bulloch County, June 27 (no. 971), and seen the next day in similar situations in Emanuel County, near the rosemary sand-hills. This species has not to my knowledge been reported from Georgia before, or from any adjacent state except Florida. In Bulloch County it is known as "sand-spur," a name which in Southwest Georgia seems to be applied exclusively to *Cenchrus echinatus*. But I found to my surprise that no species of *Cenchrus* seems to be known in the upper part of Bulloch County, and the farmers there are to be considered fortunate in not having made the acquaintance of these pests.

BAPTISIA PERFOLIATA (L.) R. Br.

A common and conspicuous inhabitant of the dry pine-barrens of Bulloch and other counties in the eastern part of Georgia. Collected along the railroad at Butts, Emanuel County, June 6 (no. 802). It has rather a restricted range, being known only from South Carolina and Georgia and probably not occurring west of the Ocmulgee River. The westernmost point at which I have seen it is in Montgomery County.

This species has several peculiarities which have never been described, though they are doubtless well known to the few botanists who have collected it. Its most striking feature is that the perfoliate leaves on the almost horizontal widely spreading branches are all placed vertically, exposing both surfaces equally to the sun and giving the plant a most striking appearance. The phyllotaxy is even more peculiar, the leaves being arranged very nearly in a single row on each branch, with the midribs all pointing toward the zenith. Strictly speaking, they alternate in two rows, with an angular divergence of 15 or 20 degrees between them, instead of 180° as in most cases of two-ranked leaves. These peculiarities are shared by no other species of *Baptisia*, and it is not surprising that this one was made the type of a new genus by Rafinesque.

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* Contr. U. S. Nat. Herb. **6**: 62. 1901.

MEIBOMIA PAUCIFLORA (Nutt.) Kuntze

Collected in rich shady woods near Chokee Creek, Sumter County, on the morning of July 25 (no. 1114). This species differs considerably from its relatives in its flowers. The corollas are not only pure white, as is hinted in the Illustrated Flora and Dr. Britton's Manual, but also more regular than in the other species. The two lower petals instead of being united into a keel are widely diverging, as are the very similar wing-petals. The corolla is therefore hardly papilionaceous, and almost the only evidence of irregularity about it is the larger size of the standard, which is three or four times as broad as the other petals. Most descriptions say nothing about the color of the petals of this species, but Mr. T. H. Kearney and Professor A. Ruth, who have collected it in Tennessee, inform me that their experience has been the same as mine in this respect.

This may perhaps be considered the most primitive species in the genus. In its other characters besides those mentioned it resembles very much its near relative *M. grandiflora* (Walt.) Kuntze, which was found intimately associated with it and collected at the same time (no. 1115).

EUPHORBIA ERIOGONOIDES Small, Bull. Torrey Club, **25**: 614. 1898

In rather dry pine-barrens, Bulloch County, June 10 (no. 846); not common. Previously known only from McIntosh County, where Dr. Small discovered it in 1895. My specimens are less branched than his, but otherwise identical.

HELIANTHEMUM ROSMARINIFOLIUM Pursh

This long neglected (and perhaps not yet very well known) plant seems to be the most abundant species in the vicinity of Millen, growing in dry sandy soil, where I collected it on June 5, (no. 759), at which time it was not yet in flower. Mr. A. H. Curtiss collected it five weeks later at Oliver, 33 miles farther down the Ogeechee River and Central R. R., (no. 6838, distributed as

H. capitatum Nutt.), and on his labels remarks: "In eastern Georgia covering hundreds of acres of old fields as densely as a sowed crop." This is equally true around Millen. It is also more or less abundant along roadsides in the upper part of Bulloch County, where I collected it in flower on the morning of July 1 (no. 986). The original specimens, collected by Enslen, probably came from somewhere in this part of the state. *H. rosmarinifolium* never has the appearance of a native, but seems to be a strictly ruderal plant, and I have never seen it a member of a perfectly natural plant-community. It probably belongs to the considerable class of native weeds, like *Phytolacca decandra*, *Ambrosia artemisiæfolia* and *Eupatorium compositifolium*.

OSMANTHUS AMERICANA (L.) B. & H.

This species has hitherto been supposed to be confined to the immediate vicinity of the coast. But on July 19 I found it in some abundance in dry woods south of Omaha, which is 125 miles inland and probably about 300 feet above sea-level. Only a few of the specimens had fruit on them, however. It also grows on the rosemary sandhills in Emanuel County, on the sandy banks of the Flint River in Sumter County and of Muckalee and Kinchafoonee Creeks in Lee, and in Decatur County near Whigham, as well as on Tybee Island on the coast. It is usually sterile and therefore likely to be overlooked.

SABBATIA FOLIOSA Fernald, Bot. Gaz. **33**: 155. 21 F 1902

Collected in the swamp of Big Lott's Creek, Bulloch County, June 27 (no. 964), and on the shore of a small pond in Decatur County, August 12 (no. 1196). Both numbers have been examined and identified by Mr. Fernald. Seen also at several other points in Bulloch, Emanuel, Tattnall, Montgomery, Telfair, Dodge, Wilcox, Dooly, Thomas and Decatur counties. Mr. Fernald cites specimens of this species only from South Carolina and Florida. It seems to occur also in Alabama, for Dr. Mohr's specimens from Vinegar Bend, Washington County, mentioned in his Plant Life of Alabama as *S. dodecandra*, are good *S. foliosa*. Much of the southern material which has passed as *S. dodecandra* will probably turn out to be the latter species. Mr. Fernald informs me that there are no authentic specimens of the former in the Gray Herbarium from farther south than North Carolina.

The two species are very closely related, differing perhaps in habitat as much as in any other way. *S. dodecandra* seems to be mostly a maritime plant, while the usual home of *S. foliosa* is in creek and river swamps. *S. foliosa* seems to represent one extreme of the *dodecandra* group, of which *S. decandra* is the other.

ASCLEPIAS HUMISTRATA Walt. (*A. amplexicaulis* Michx., not J. E. Smith)

Grows sparingly in dry pine-barrens and on sand-hills in Bulloch County (no. 833, June 10), also seen in Effingham and Stewart counties, always on the Columbia formation. This is another species which seems never to have been completely described. Its glaucous fleshy leaves are so twisted at their points of insertion on the decumbent branches that they lie in vertical planes, giving the plant a very different appearance from any of its Eastern relatives, if not from all other species of the genus. The leaves are practically alike on both surfaces, and their vertical position is of course an example of a well-known adaptation for protection against excessive transpiration. The phyllotaxy of this species is also peculiar, the successive pairs of leaves being not decussate but parallel, analogous to the case of *Baptisia perfoliata* already mentioned.

Asclepias rubra laurifolia (Michx.)

A. laurifolia Michx. Fl. Bor. Am. **1**: 117. 1803.

Differs from *A. rubra* L., in the shape of the leaves, which are lanceolate from a cordate or somewhat hastate subsessile base, tapering uniformly to the apex, or the upper ones narrowed at the base.

Collected in low grounds near Muckalee Creek, Americus, July 29 (no. 1128). Accompanied by *A. lanceolata* Walt. (no. 1127), which it much resembles. Also found in former years in several similar localities within a few miles of Americus, but apparently quite rare, as I have never seen more than two or three individuals at one time.

Asclepias laurifolia Michx. has usually been regarded as identical with *A. rubra* L., but my specimens and others which I have seen (mostly from Georgia), agree very well with Michaux's description and are easily distinguished from *A. rubra,* a plant of more northern range, by the shape of the leaves, which appears to be quite constant. But as this is about the only difference, it seems best to treat Michaux's plant as a variety of *A. rubra.* This may possibly have been done before, but it would be impossible to ascertain this without wading through a great mass of literature. Michaux himself did not contrast the two plants, as he did not mention *A. rubra.* Miss Vail, who has seen his type specimen, which was found "secus amnem Althamaha, in Georgia," says that my specimens resemble it very closely. In the Columbia University Herbarium are specimens of the same plant collected in Georgia by Dr. Boykin and Dr. Chapman (without definite locality), and in Louisiana by Dr. Hale.

NAMA OVATA (Nutt.) Britton. (*Hydrolea ovata* Nutt.)

Collected in shallow water in the Slough near Camilla, Mitchell County, August 8 (no. 1170). I know of no other definite station in Georgia for this species, which is more frequent farther west. It is remarkable for being one of the few aquatic or semiaquatic plants which are both pubescent and spiny. The spines are sufficiently numerous to make collecting disagreeable when one has to wade in after it barefooted.

COLLINSONIA TUBEROSA Michx.

In rich shady woods on the north side of a bluff of Oostanaula shale east of Dalton, Whitfield County, at 720 feet altitude, September 7 (no. 1287). Has very much the babit of *Phryma Leptostachya*, which grows with it, and its flowers have almost exactly the same odor as those of *Dicerandra odoratissima.* This *Collinsonia* seems to be quite rare, but it is imperfectly understood and its nomenclature is somewhat uncertain.

LINARIA FLORIDANA Chapm.

Collected on the rosemary sand-hills of Emanuel County, June 28 (no. 976); evidently long past flowering, and with overripe capsules. Previously known only from drifting sands along the Gulf coast.

PLANTAGO SPARSIFLORA Michx.

Seen only in rather dry pine-barrens about two miles south of Smithville, Lee County, where I collected it on the morning of August 3 (no. 1163). This species has much the appearance of some Melanthaceous plant, for which I mistook it at first glance. It seems to be very rare. There are no specimens of it in the U. S. National Herbarium or that of the New York Botanical Garden besides my own, but in the former there are two specimens so labeled, one from Illinois and the other from Kansas, which are something entirely different. The label of one of them bears a note to a effect that the capsules are 5-seeded, and the other one is similarly noted to have 6-seeded capsules; while in *P. sparsiflora* they are 2-seeded.

In the Columbia University Herbarium are two old and imperfect but unmistakable specimens of *P. sparsiflora*, one from North Carolina and one from South Carolina, as well as a very doubtful specimen from Louisiana and one from Illinois similar to those in the National Herbarium. All these western specimens are annual, while *P. sparsiflora* is perennial from a stout rootstook. Just what the western plant represents is not clear. It may be a form of *P. Virginica*, or perhaps Michaux's *P. Kentuckensis*, a species which seems never to have been recognized. *P. sparsiflora* is credited to Illinois in Britton and Brown's Illustrated Flora, doubtless on the basis of the specimens just mentioned, but it would be indeed remarkable if a species should occur both in Georgia and Illinois without being known from intermediate stations. The true *P. sparsiflora* is known only from the coastal plain of Georgia and the Carolinas, which is about the range given by the Michaux. My specimens, which were probably the first collected for many years, agree perfectly with the original description and most of the later ones.

VIBURNUM NITIDUM Ait. Hort. Kew. **1**: 371. 1789

V. nudum β angustifolium Torr. & Gray, Fl. N. Am. **2**: 14. 1841.

Collected in the swamp of a small pine-barren stream, Bulloch County, June 8 (no. 831), in fruit. This species does not seem to have been recognized by most recent authors, but my attention was called to it by a description in Dr. Mohr's Plant Life of Alabama,* which agrees very well with my specimens. It is very close to *V. nudum*, but can be distinguished in the field without much difficulty. *V. nudum* was collected near the same place two days later (no. 842).

VERNONIA MAXIMA Small, Bull. Torrey Club, **27**: 280. 1900

Abundant on the muddy banks of Mill Creek about two miles east of Dalton, Whitfield County, where I collected it on September 7 (no. 1292). Not previously reported from Georgia.

CACALIA SULCATA Fernald, Bot. Gaz. **33**: 157. 21 F 1902

I have known this species since August 22, 1896, when I first collected it in a sandy bog southeast of Americus, twelve miles from the type-locality given by Mr. Fernald. I have specimens collected at the same place August 20, 1897, and on the same date in 1900 (no. 435). This locality is especially characterized by the presence of *Juncus trigonocarpus* and *Sarracenia Drummondii.* I was never able to refer my specimens to any described species until I saw Mr. Fernald's description, which I immediately recognized as belonging to my plant. I have not seen any of the type material (Curtiss's no. 6884A, from Smithville, Lee County, Ga., August 26, 1901), the only specimen of it distributed by Mr. Curtiss being in the Gray Herbarium, but Mr. Fernald has compared one of my specimens with the type and pronounces them identical.†

This species of course belongs to the genus *Mesadenia* Raf., but Mr. Fernald does not consider *Mesadenia* distinct from *Cacalia*, and as I have not sufficient knowledge of these plants to disagree with him, I refrain from changing the name.

COLLEGE POINT, N. Y.

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* Contr. U. S. Nat. Herb. **6**: 744. 1901.

† I have recently (October, 1902) seen a specimen of the same thing collected in Lee Co., Aug. 20, 1894, by the late Mrs. Sarah Thompson, of Smithville.